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Application No. 10/758,966
Final Office Action Dated February 28, 2007
Amendment Dated May 29, 2007
Attorney Docket No. F125

MAY 30 2007

Amendments to the Claims:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (original) A method of restoring the transparency of a quartz material having implanted gallium that reduces the transmission of the quartz material, comprising:
directing a gas towards a gallium implanted portion of the quartz material; and
directing an electron beam towards the gallium implanted portion of the quartz material, the electron dose of the electron beam being such that the thickness of the quartz material is substantially unchanged, and the transmission of the quartz material is substantially increased.
2. (original) The method of claim 1 in which directing a gas towards the portion of the quartz material includes directing a gas comprising a halogen compound.
3. (original) The method of claim 2 in which directing a gas towards the portion of the quartz material includes directing a gas comprising xenon difluoride.
4. (original) The method of claim 1 in which directing an electron beam towards a portion of the quartz material includes directing an electron beam towards a portion of the quartz material such that the transmission is increased to greater than 80% of the transmission of the quartz material without implanted gallium.
5. (original) The method of claim 1 in which directing an electron beam towards a portion of the quartz material includes directing an electron beam toward a portion of the quartz material such that the transmission is increased to greater than 90% of the transmission of the quartz material without implanted gallium.

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6. (original) The method of claim 1 in which directing an electron beam toward a portion of the quartz material includes directing an electron beam toward a portion of the quartz material such that the thickness of the quartz material changes by less than 2 nm.

7. (original) The method of claim 1 in which directing an electron beam toward a portion of the quartz material includes directing an electron beam toward a portion of the quartz material such that the thickness of the quartz material changes by less than 5 nm.

8. (original) The method of claim 1 in which directing an electron beam toward a portion of the quartz material includes directing an electron beam toward a portion of the quartz material such that the thickness of the quartz material changes by less than 10 nm.

9. (original) The method of claim 8 in which includes directing an electron beam toward a portion of the quartz material such that the transmission is increased to greater than 90% of the transmission of the quartz material without implanted gallium.

10. (original) The method of claim 1 in which directing an electron beam towards a portion of the quartz material includes providing an electron dose of less than 2.0 nC/ μm^2 .

11. (original) The method of claim 10 in which directing an electron beam toward a portion of the quartz material includes providing an electron dose of between about 0.1 nC/ μm^2 and about 1.0 nC/ μm^2 .

12. (original) The method of claim 11 in which directing an electron beam toward a portion of the quartz material includes providing an electron dose of between about 0.4 nC/ μm^2 and about 0.8 nC/ μm^2 .

Claims 13-20 canceled.

21. (currently amended) A method of restoring the transparency of a transparent substrate having an implanted material that reduces the transmission of the substrate, comprising:

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providing a gas at the surface of a substrate; and
directing an electron beam toward the substrate, the electron beam, the gas and the substrate
interacting to increase the transparency to the substrate, in which directing said electron beam
toward the substrate includes restoring the transparency of the substrate to greater than 90% of
the transparency without the implanted material, and The method of claim 20 in which directing
an electron beam toward the substrate includes etching the substrate by less than 5 nm.

22. (currently amended) A method of restoring the transparency of a transparent substrate
having an implanted material that reduces the transmission of the substrate, comprising:
providing a gas at the surface of a substrate; and
directing an electron beam toward the substrate, the electron beam, the gas and the substrate
interacting to increase the transparency to the substrate. The method of claim 13 in which
directing an electron beam toward the substrate includes etching the substrate by less than 5 nm.